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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,459	09/05/2003	Sang-Soo Kim	YOM-0055	8432

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EXAMINER	
LIANG, REGINA	

ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 10/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/656,459	KIM ET AL.	
	Examiner	Art Unit	
	Regina Liang	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) *1-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15,16,18-20 and 25-28* is/are rejected.

7)☒ Claim(s) *17 and 21-24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restriction

1. Applicant's election without traverse of Invention II (Claims 15-28) on 7/28/06 is acknowledged.

2. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 15, 16, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terasaki (US 5,844,540) in view of Takemoto (US 6,417,833).

As to claim 15, Fig. 1 of Terasaki discloses a LCD device comprising:

a liquid crystal panel assembly (liquid crystal panel 1a) including a plurality of gate lines, a plurality of data lines, a plurality of pixels connected to the gate lines and the data lines (col. 9, lines 34-48);

a gate driving circuit (gate driving circuit 1b2) for driving the gate lines; a data driving circuit (source driving circuit 1b1) for driving the data lines;

a lamp unit (4) for illuminating the panel assembly;

a system board (image processing/system control section 2, back-light power source supply section 6) for generating image signals (VR, VG, VB), first control signals (composite synchronizing signal Csy) for controlling the image signals, and a voltage signal (voltage from power source supply section 6) for driving the lamp;

a control board (liquid crystal panel control section 1c, the PWM dimmer driving circuit section 7) for processing the image signals (VR, VG, VB) from the system board based on the first control signals (Csy) from the system board, generating second control signals (Hsy, Vsy) for controlling the processed image signals and a third control signal (Vpwm) for driving the lamp, and providing the processed image signals and the second control signals for the driving circuits.

Terasaki also teaches the display panel illuminator including an inverter (5) for generating driving signals for driving the lamp unit (4) based on the third control signal (Vpwm) from the control board (7) and the voltage signal from the system board (6).

Terasaki does not teaches the display panel illuminator having a plurality of lamp units including a plurality of lamps illuminating the panel assembly, and a plurality of inverter boards connected in series.

However, Figs. 5 and 6 of Takemoto teaches a LCD device using a plurality of lamp units (in Fig. 6, lamps 5 and 6 are one lamp unit, lamps 7 and 8 are another lamp unit) including a plurality of lamps (5-12) for illuminating the LCD panel (2 in Fig. 5), a plurality of inverter boards (the driver circuits 21-24 in Fig. 6) connected in series for generating driving signals for driving the lamps (col. 3, lines 30-64). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display panel illuminator of Terasaki to have a plurality of lamp units and a plurality of inverter boards as taught by Takemoto since "the generation of the ripple phenomenon can be suppressed, and the noise due to the ripple phenomenon can be eliminated, so that a liquid crystal display apparatus with improved quality of display can be provided" (col. 2, lines 29-34 of Takemoto).

As to claim 16, Terasaki teaches the inverter (5 in Fig. 1) transmitting the third control signal or the voltage signals; and Takemoto teaches the output signal of the driver circuit 21 (inverter) is given to the driver circuit 22 (inverter). Thus, Terasaki as modified by Takemoto teaches the limitation as claimed.

As to claim 18, Fig. 6 of Takemoto teaches each lamp unit comprising a plurality of lamps connected in parallel (lamps 5 and 6 are connected in parallel).

As to claim 19, Fig. 6 of Takemoto teaches the serial connection between the inverter boards (driver circuits 21-24) is made along a direction perpendicular to a length direction of the lamps.

As to claim 20, Fig. 1 of Terasaki teaches the inverter (5) having two input terminals for inputting the third control signal (Vpwm) and the voltage signal from the power source supply

section. Thus, Terasaki as modified by Takemoto would have two connectors in each of the inverter boards as claimed.

5. Claims 25, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terasaki and Takemoto as applied to claim 1 above, and further in view of Miyachi (US 6,982,686).

As to claim 25, Fig. 3 of Terasaki teaches each lamp has first and second terminals connected to the inverter, the second terminal is supplied with a predetermined voltage (Fig. 6). Terasaki as modified by Takemoto does not explicitly disclose the first terminal is grounded. However, Miyachi teaches a LCD device with backlight lamps, each of the lamp having first and second terminals connected to an inverter, the first terminal is grounded and the second terminal is supplied with predetermined voltage. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify each lamp of Terasaki as modified by Takemoto to have the first terminal connected to a ground as taught by Miyachi since this provides a potential difference between the two terminals of the lamp and drives the lamp to emit light.

As to claim 26, Miyachi teaches the lamp having the second terminal (the terminal supplied with a predetermined) is connected to the inverter, the first terminal (the terminal is grounded) is far from the inverter. Thus, Terasaki as modified by Takemoto and Miyachi teaches each inverter board is close to the second terminal of the corresponding lamp unit than to the first terminal thereof.

6. Claims 27, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terasaki and Takemoto as applied to claim 1 above, and further in view Fujishiro et al (US 6,917,354 hereinafter Fujishiro)

As to claim 27, Fig. 3 of Terasaki teaches each lamp has first and second terminals connected to the inverter. Terasaki as modified by Takemoto does not explicitly disclose the first and second terminals supplied with positive and negative voltages, respectively. However, Fujishiro teaches a fluorescent lamp having first and second terminals (cathode and anode), a positive voltage is applied to the anode and a negative voltage is applied to the cathode such that an electric discharge is caused between the anode and the cathode of the lamp (col. 1, lines 42-59). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Terasaki as modified by Takemoto to apply positive and negative voltages, respectively to the first and second terminals as taught by Fujishiro since an electric discharge is caused between the two terminals of the lamp, and ultraviolet rays are emitted from the fluorescent lamp.

As to claim 28, Terasaki as modified by Takemoto and Fujishiro discloses the claimed invention except for each inverter board is located near the center of the corresponding lamp unit. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Terasaki as modified by Takemoto and Fujishiro to locate each inverter board as claimed, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Allowable Subject Matter

7. Claims 17, 21-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Numao (US 6,803,901) teaches a display device and light source.

Lee et al (US 7,019,728) teaches a LCD device with a backlight device.

Kyomoto (US 6,956,555) teaches a light modulation information display device and illumination control device.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Regina Liang whose telephone number is (571) 272-7693. The examiner can normally be reached on Monday-Friday from 8AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Hjerpe, can be reached on (571) 272-7691. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Regina Liang
Primary Examiner
Art Unit 2674

9/29/06